REMARKS

Claims 3-9 were rejected as unpatentable over ELASSAAD et al. 2004/0257207 in view of PORTERFIELD 6,588,001 and KUMAMOTO 4,695,748. Reconsideration and withdrawal of the rejection are respectfully requested.

The claims are directed to the repeaters in a signal transmission line. Each of the repeaters has first and second logic gates (with an inverting function) arranged in order along the direction of signal transmission in a signal transmission line. The first logic gate has a higher current driveability than that of the second logic gate.

In applicant's previous response, applicant pointed out that there is a significant reason for not combining KUMAMOTO with the other references, namely the admitted prior art (APA) teaches against such a combination. The Official Action did not address applicant's comments in this regard and offers no comment at all why one of skill in the art would ignore the APA. Clearly, one of skill in the art is presumed to have knowledge of the prior art, including the APA.

The APA is JP-A-2001-290854 that discloses two cascaded inverters in a signal transmission line (page 4, beginning at line 9). The APA discloses cascaded inverters where the driveability of the inverters is <u>opposite</u> that claimed (page 5, lines 19-22); in other words, in the APA the second logic gate has a higher current driveability than that of the first logic

gate. Thus, if one of skill in the art had before him ELASSAAD et al., PORTERFIELD, and the APA (all three related to the repeaters), there would be no suggestion to change the driveability of the cascaded inverters from that of the APA. The Official Action presumes, without explanation, that the reason offered in KUMAMOTO for arranging the inverters in this way is superior to the reason offered in the APA for NOT arranging them in this way. As previously explained, the teachings of the APA directly relate to repeaters and represent, as best understood, what is actually being done by those in the art today. Nothing in KUMAMOTO indicates why the APA is no longer good technology and should be overruled by KUMAMOTO.

Ignoring applicant's argument is a clear legal error. Consideration of and a response to the applicant's argument are respectfully requested.

The Official Action adds KUMAMOTO to these references. However, as explained in the previous response, KUMAMOTO is unrelated to repeaters. The allegation that inverters 6 and 9 in KUMAMOTO form a repeater is a factual error. A technical definition of a repeater is attached in the Appendix and hereby made of record.

KUMAMOTO discloses a comparing device that has no use in a repeater. One of skill in the art would not turn to a reference that discloses a comparing device when considering improvements to a repeater. As explained in the present

application, a repeater is used in a signal transmission line to reduce propagation delay (page 1, line 24-25), and propagation delay increases in proportion to the product of line resistance and line capacitance. Comparing voltages is not a factor.

The Official Action explains that the comparing device in KUMAMOTO includes components that constitute a repeater, and thus the reference does pertain to repeaters. However, the device functions as a comparing device regardless of what it has inside. The improvements therein relate to its operation as a comparing device. One of skill in the art would see that whatever is done in KUMAMOTO is done to make the comparing device work better; not to make a repeater work better. The improvements therein are related to the comparing device as a whole and cannot be attributed particularly to a set of components in the comparing device that may be arranged in a manner similar to that of a repeater.

Further, the motivation offered to combine KUMAMOTO with the other references is not relevant. The Official Action states that one of skill in the art would arrange the inverters as suggested in KUMAMOTO to provide a repeater that can detect and amplify an input voltage precisely at high speed. While this may be important in comparing devices, detecting and amplifying input voltages precisely at high speed and comparing voltages are simply not considerations in repeaters. The issue in repeaters is reduced line capacitance, not voltage detection.

In addition, even if KUMAMOTO includes a repeater, there is no suggestion to provide the improvement claimed. KUMAMOTO discloses a capacitor 5, inverters 6, 9, and 11, and transmission gates 3, 4, and 22. The Official Action indicates inverters 6 and 9 form a repeater. This is not correct because the inverter 6 is a detector detecting the potential difference between Vin and Vref. This is shown in the abstract and column 5, lines 20-29. "The second inverter (9) and the third inverter (11) have a desired voltage amplifying function so that <u>the voltage difference detected by the first inverter (6)</u> can be amplified by these two inverters (9 and 11)" and "the CMOS inverter 6 has a function of detecting a voltage difference and the CMOS inverters 9 and 11 have a function of amplifying a voltage difference."

It is generally accepted that the term "repeater" means an amplifier that process weak signals and transmits stronger signals. This is shown in the attached publication. Thus, the repeater is not a device that detects a voltage. The inverter 6 in the reference receives Vref or Vin, and outputs a data that corresponds to the comparison result, i.e., outputs "1" if Vin<Vref and outputs "0" if Vin>Vref. That is, the inverter 6 does output an amplified signal. This function of the inverter 6 is totally different from the function of a repeater that resends stronger signals in place of received weak signals.

In this sense, inverters 9 and 11 among the devices shown in KUMAMOTO may resemble a repeater because the inverters 9 and 11 amplify the output of the inverter 6. Thus, it may be said that the technique taught by KUMAMOTO includes capacitance 5 and detector 6 connected to Vin and Vref, and a repeater configured by the inverters 9 and 11. However, since the inverters 9 and 11 have the same driving capability, this configuration only corresponds to the prior art recited in the text of the present application.

The reason why the inverter 6 of KUMAMOTO is not recognized as a repeater is as follows:

ELASSAAD teaches a technique for obtaining the number and location of the repeaters to be inserted based on the length of the signal line and the size of the repeaters, without using a delay constraint. As understood from Figure 3 of the reference and descriptions [0068] and [0070], the premise of ELASSAAD is to use repeaters having the same size or same driving capability.

PORTERFIELD teaches insertion of a repeater (configured by two inverters) between a logically high order level and a logically lower order level if the logically lower order level is generated. In this reference, although the feature of the repeater is not specifically recited, the script of column 5 includes the following:

```
repeater_inv = library + "/INRBX3V2"
create_cell inv1 repeater_inv
```

create_cell inv2 repeater_inv.

This clearly shows the premise that two inverters having the same configuration are used as the repeater. In other words, this reference does not expect to use two inverters having different configurations. (In the above script, INRBX3V2 means the name of inverter registered in the cell library; and "create_cell inv1 repeater_inv" means that INRBX3V2 is disposed in the name of instance "inv1".)

As described above, both ELASSAAD and PORTERFIELD use repeaters having the same configuration, and do not teach use of the repeaters having different configurations as well as the advantage thereof and the problem encountered by the size of the inverters. Thus, a skilled person generally uses repeaters having the same configuration, and it is apparent that the recognition of the inverters 6 and 9 as a repeater is hindsight based on the present invention.

Accordingly, the technique described in KUMAMOTO only relates to a comparator, which the skilled person cannot easily combine with the technique of insertion taught by ELASSAAD and PORTERFIELD, and even if the skilled person could combine both the techniques, inverters 9 and 11 will be used by the skilled person and thus combination of inverters 6 and 9 is difficult for the skilled person to achieve. Again, recognition of the inverters 6 and 9 in KUMAMOTO is hindsight based on the present invention.

In view of the foregoing remarks, it is believed that the present application is in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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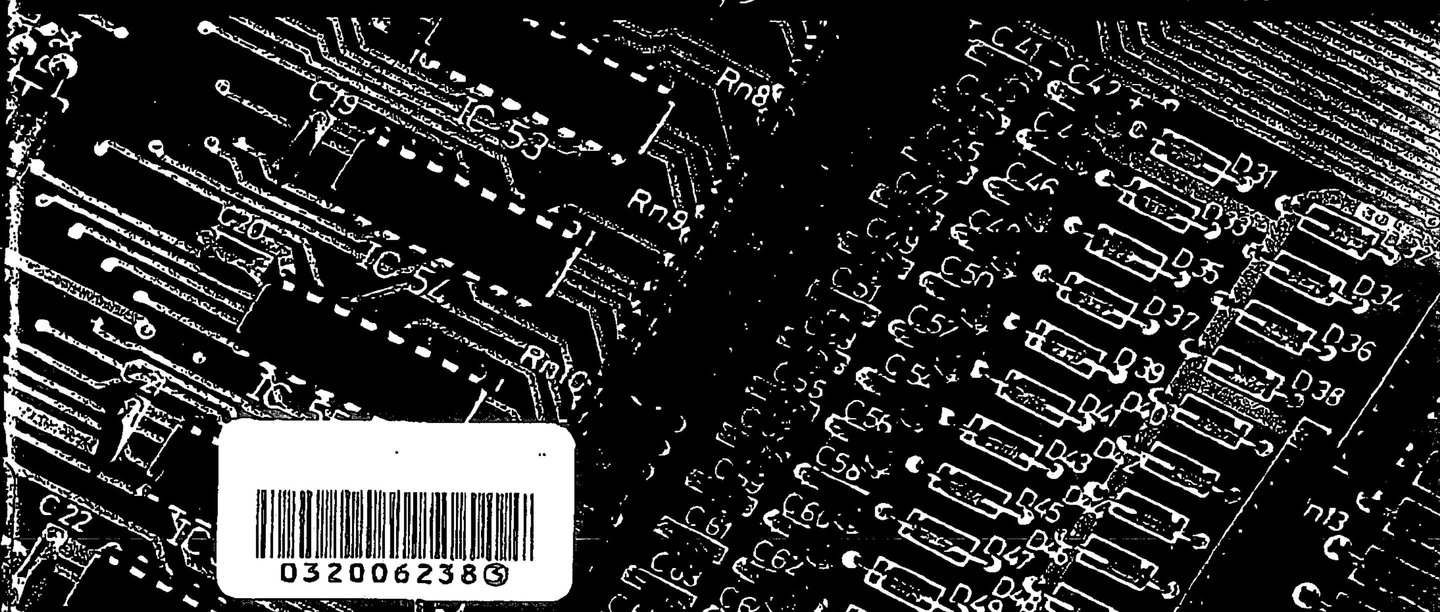
APPENDIX:

The Appendix includes the following item:

- McGraw-Hill Electronics Dictionary, Fifth Edition, page 450, technically defining the term "repeater"

McGRAW-HILL ELECTRONICS DICTIONARY

- Over 14,000 terms
- More than 1,500 illustrations



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  - ✓ solid-state component design and fabrication
  - ✓ passive component design and manufacture
  - ✓ circuit board fabrication and component assembly
  - ✓ electronic product and system packaging
  - ✓ computer hardware and software
  - ✓ scientific and medical instrumentation
  - ✓ industrial instrumentation and control
  - ✓ telecommunications and fiber optics
  - ✓ consumer entertainment products
  - ✓ military/aerospace communication, detection, navigation, ranging, and surveillance.

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release time The total elapsed time from the instant that relay coil current starts to drop until the make contacts have opened or the break contacts have closed.
reliability The probability that a device will perform its purpose adequately for the period of time intended under the operating conditions encountered.
reliability engineering A field of engineering that deals with the prevention and correction of malfunctions in equipment.
reliability index A quantitative figure of merit related to the reliability of a piece of equipment, such as the number of failures per 1000 operations or the number of failures in a specified number of operating hours.
reliability test A test designed specifically to evaluate the level and uniformity of reliability of equipment under various environmental conditions.
reluctance A measure of the opposition presented to magnetic flux in a magnetic circuit. Reluctance is the reciprocal of permeance, and is therefore equal to magnetomotive force divided by magnetic flux. The unit of reluctance is the rel, equal to 1 ampere-turn per magnetic line of force.
reluctance microphone *Variable-reluctance microphone.*
reluctance motor A synchronous motor, similar in construction to an induction motor, in which the member carrying the secondary circuit has salient poles but no DC excitation. It starts as an induction motor but operates normally at synchronous speed.
reluctance pickup *Variable-reluctance pickup.*
reluctivity The ratio of the magnetic intensity in a region to the magnetic induction in the same region. Reluctivity is the reciprocal of magnetic permeability.
rem Abbreviation for *roentgen equivalent man.*
remanence The magnetic flux density that remains in a magnetic circuit after the removal of an applied magnetomotive force. If the magnetic circuit has an air gap, the remanence will be less than the residual flux density.
remanent charge The charge that remains in a ferroelectric device when the applied voltage is removed.
remanent induction The induction that remains in a magnetic material when the magnetomotive force around the magnetic circuit is zero.
Remendur A high-performance magnetic material that can have a remanence as high as 21.5 kG. It is a malleable, ductile, cobalt-iron-vanadium alloy.
remodulation Transferring modulation from one carrier to another.
remodulator A circuit that converts amplitude modulation to audio frequency-shift modulation for transmission of facsimile signals over a voice-frequency radio channel.
remote *NEMO.*
remote control Control of equipment from a distance over wires or by light, radio, sound, ultrasonic waves, or other means.
remote cutoff The characteristic in which a large negative bias is required for complete cutoff of output current in an electron tube or other amplifying device.
remote indicator 1. An indicator at a distance from the data-gathering sensing element, with data being transmitted to the indicator mechanically, electrically over wires, or by light, radio, or sound waves. 2. *Repeater.*
remote line A program transmission line between a remote-pickup point and a broadcast studio or transmitter site.
remotely piloted vehicle [RPV] A robot aircraft, controlled over a two-wave radio link from a ground station or mother aircraft that can be many miles away. Electronic guidance is generally supplemented by remote-control television cameras feeding monitor receivers at the control station.
remote metering *Telemetering.*
remote pickup Picking up a radio or television program at a remote location and transmitting it to the studio or transmitter over wire lines or a shortwave or microwave radio link.
remote programming Control of the output voltage or current of a regulated power supply by a remotely varied resistance or voltage.
remote sensing 1. The acquisition of information by sensors that are not in physical contact with the phenomenon or object under study. Examples are the measurement of radiation, temperature, pressure, and other variables with sensors that might be packaged in compact cases with a battery-powered radio-frequency transmitter. The habits and physiology of animals in the wild can be monitored by remote sensing, as can the activity levels of volcanoes. 2. The use of sense leads to connect the power supply to the load and provide feedback to the voltage regulation circuits of the supply. This circuitry compensates for voltage losses resulting from long cables to a load.
REN Abbreviation for *ringer-equivalence number.*
rendezvous radar Radar designed for use in orbital rendezvous and docking in space.
rep 1. Abbreviation for *roentgen equivalent physical.* 2. Abbreviation for *representative.*
repeatability 1. A measure of the variation in the readings of an instrument such as a precision potentiometer when identical tests are made under fixed conditions. Also called reproducibility. 2. The ability of a voltage regulator or voltage reference tube to attain the same voltage drop at a stated time after the beginning of any conducting period.
repeater An amplifier and associated equipment that processes weak signals and retransmits stronger signals without reshaping their waveforms. It can be a one-way or two-way repeater. Repeaters are used in telephone lines, undersea cable, and fiber-optic cables to overcome the effects of signal attenuation in the transmission media. There are also radio-frequency repeaters, especially for amplifying weak signals in the microwave region and permitting those signals to be relayed past the horizon for long-distance transmission.
repeater jammer A jammer that intercepts an enemy radar signal and reradiates the signal after modifying it to incorporate erroneous data on bearing, range, or number of targets.
repeater station A station that contains one or more repeaters. It is also called a relay station.
repeating timer A timer that continues repeating its operating cycle until excitation is removed.
repeat-point tuning *Double-spot tuning.*
repeller An electrode whose primary function is to reverse the direction of an electron stream in an electron tube. It is also termed a reflector.
reperforator *Tape reperforator.*
repertory dialer Electronic equipment that stores a repertory of telephone numbers and dials them automatically on request, as is used in telephone solicitation.